0821-SW183

# REPORT ON THE "FERN MINE"

by

003255

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LOCATION:

The Fern Mine is located about 14 miles from Nelson, British Columbia. It is reached by automobile road to Hall Siding, eleven miles Southeast of Nelson. From there a narrow mountain road three miles in length extends to the camp buildings of the property.

The property lies on the Southerly side of Hall Creek, extending from the Hall Creek valley to the summit between Hall and Barrett Creeks. The difference in elevation between Hall Creek and the summit is approximately 2,000 feet.

Hall Creek valley is well suited for a millsite and Hall Creek is a mountain stream carrying during its minimum flow about five cubic feet per second of water.

The Great Northern Railway Company has a branch line running from Nelson to Spokane, which passes the mouth of Hall Creek. At this point there is a flag station and at one time the town of Hall had two hotels and a population of probably 200 people.

The mountainside on which the Fern Mine is located has been burned over within the past five years, and most of the timber has been destroyed. Enough is left to supply mining timbers for some years. The property consists

of five Crown Granted claims, all located in the Nelson Mining Division of West Kootenay District, B.C., viz.:

Lot 2161 Etruria
Lot 305 Hidden Treasure
Lot 364 Chicora
Lot 374 Fern
Lot 399 Eureka.

Besides these Crown Granted claims, two claims held by location, being the Nadir Fraction and the H.T. Fraction, and two claims held by lease from the B.C. Government, viz.:

Lot 3283 Imperial
Lot 3674 Eclipse,

are in the name of L.L. Adams, and are held in trust for the Gold Fern Syndicate. The two latter claims can be Crown Granted by paying the back taxes before April 1st., 1935, amounting to $53.60.

HISTORY:

The property known as the Fern Mine was first staked in 1892. It was operated by private interests for some years. Its output during that time is uncertain, but it is known that high grade ore was shipped to the Smelter at Pilot Bay, B.C. and to the Hall Mines Smelter at Nelson, B.C. Later it was taken over and operated by the Fern Gold Mining and Milling Company. This Company operated the property from 1897 to 1902 or 1903.

A ten stamp mill was erected on Hall Creek and a surface tramway carried the ore from the mine to the mill. The plant is estimated to have cost about $50,000.00. Records

of its production are incomplete, but there seems to be no doubt that in 1897 the Company produced $40,000.00 worth of gold in the mill, besides an indefinite amount received from the shipment of crude ore to the Smelter at Nelson. This was produced during an operation covering four and one half months. In 1898 one cleanup netted $6,650.00 and crude ore was also shipped. One carload is reported as being worth $3,000.00. No data is available for 1899, but in 1900 approximately 6,000 tons were milled. In 1902, under lease the mill treated 750 tons per month during the period of its operation. It was in operation during a part of 1903 and 1904, but no records of production are accessible. Since 1904 the property has been operated for short periods by leasors, but as shipments made to the Smelter during these times were made in the names of the leasors, the records are difficult to obtain. It is estimated that the total amount of ore mined from the old workings is about 15,000 tons and that the gross amount of bullion produced approximates $225,000.00, which gives $15.00 per ton as an average of the bullion produced per ton of ore, which seems to agree fairly well with the values saved from the ore where records are available. It is estimated by mill men who operated the Fern mill that not more than seventy per cent. of the values were saved. This would indicate that the average gold content of the ore so far mined from the Fern equalled about one ounce of gold per ton. This estimate seems to be about correct if one can judge from the values in the ore left in the old workings.

EQUIPMENT:

The old mill and plant have been completely destroyed by fire, and any parts of value have been removed from the property. This property is now being developed by the Gold Fern Syndicate of Toronto, Ontario. This Syndicate has also, through Mr. Adams, a lease from the B.C. Government on the Imperial and the Eclipse claims, and similarly holds, in its own name, a lease and bond on the balance of the claims in the group. Under the present operation, which started in November 1934, new camp buildings, consisting of compressor house, bunk and cook house, dry for the men, root cellar, blacksmith shop and powder house have been constructed. A Denver-Gardiner compressor of 340 cubic feet capacity, driven with a 50 h.p. Deisel engine, has been installed. Further new equipment consists of complete cook and bunk house accommodations, two Canadian Ingersoll-Rand machine drills No. N-82, with a plentiful supply of machine steel, ore car, track rails and blacksmith supplies. Besides this material at camp, the Syndicate owns a two-ton International truck, used for transporting supplies.

PAST DEVELOPMENT:

The property, located as it is on a steep mountain side, lends itself to economical development by tunnels. The old Company drove four tunnels. No.1 tunnel, elevation 5,090 feet, is 157 feet in length and was continuously in ore. No.2 tunnel, elevation 5,030 feet, is 270 feet long and is

PAST DEVELOPMENT - continued:

also in ore its entire length. No.3 tunnel, elevation 4,955 feet, is a crosscut for 95 feet and is a drift on the vein for 350 feet. No.4 tunnel, elevation 4,810 feet, is a crosscut for 160 feet and a drift for 90 feet on a slip plane, and from there on for 540 feet it is a drift on the vein. For the first 230 feet of this distance it was driven on what was thought to be the Fern Vein, but it may have been a fracture zone running parallel to the vein. With the exception of one place in the No.3 tunnel, no crosscutting was done to look for parallel veins. The vein in both No.3 and No.4 tunnels was cut off by a lamprophyre dyke. This dyke is about 15 feet wide and cuts the vein at a wide angle. The old Company drove a crosscut to the Northwest, exploring for the continuation of the vein, but the work was done in the dyke itself and of course proved nothing. Later the dyke was cut on both the No.3 and No.4 levels and short drifts were run both to the right and the left in an effort to pick up the vein. These drifts have proved of no value, as they were close to the dyke and there is clearly shown to be a broken up area on the southerly side of the dyke about fifty feet wide, extending parallel to it. The work is wholly in this area. Most of this crosscutting has been done by leasors. No serious attempt has been made to find the continuation of the vein. These tunnels have opened up the Fern vein to a depth of three hundred feet below the outcrop, and for an horizontal length of 540 feet on the No.4 level. The ore shoot on No.4 level is 310 feet in

length. The width stoped varies from one foot to twelve feet, with an estimated average width of three feet.

GEOLOGY:

Dr. Charles Drysdale, in Memoir on the Ymir Mining Camp No.76, Geological Series published in 1917, spent considerable time at the Fern mine and goes into the geology of this property in detail. The formation consists of a series of granite porphyry dykes and massive argite porphyrite striking in a north easterly and south westerly direction, with similarly parallel belts of porphyritic schist. A series of small lamprophyre dykes striking easterly and westerly has caused numerous faults. The veins striking southerly are more or less parallel to the trend of the formation and represent fracture zones, which gave an opportunity for quarts and mineral disposition. A second series of fracturing, striking south easterly and north westerly, also occurs. These latter veins remain undeveloped and their productivity is yet to be proven. No attention has been given to any vein on the Fern ground except to the Fern vein. It is definitely proven that three other veins approximately parallel to the Fern vein exist. One of these was intersected by the No.3 crosscut at a point about 100 feet past the Fern vein. At the point where it was intercepted, it is eight inches wide and assays 0.2 oz. in gold. A raise was run on this vein for about 35 feet and about 25 feet of drifting done on it at that level, partly to the north and partly to the south. This vein is fully as wide at the point where cut as was the Fern vein

GEOLOGY - continued:

at the point where first opened on the No.3 level, and, containing gold values, it is certainly worthy of development. The new tunnel, started last November, opened up a third vein of this series, which has been drifted on for 20 feet, with a width of from eight inches to 28 inches. This vein stands nearly vertical, and was followed for 15 feet in the porphyrite schists, which were very badly broken and for ten feet in the granite porphyrite. The present face shows eight inches of quartz assaying 2.0 oz. in silver and $1.00 per ton in gold. This vein is promising enough to justify extensive surface exploration along its strike, with a view of determining its width and characteristics, and can be drifted on from the present working level if found to be worthy of development at depth.

About 250 feet east of the Fern another parallel vein outcrops. This has been opened for a distance of 30 feet by a drift driven by a lessor. This is probably the Old Man vein referred to in a report on the Fern mine made by C.F. Faulk, Mining Engineer of Spokane, Washington. His reference to this vein is as follows:

> "This latter vein (the Old Man vein) has been traced on the surface for a distance of 1,000 feet and wherever uncovered has shown free gold. It is a larger and stronger vein than the Fern."

I inspected the tunnel started on this vein. It is about 30 feet in length and exposes a vein about 24 inches wide, striking southwest and northeast. The tunnel is in badly

GEOLOGY - continued:

broken ground and follows the vein which rolls with the formation so that it follows along the contour of the hill. As a result, the face is barely beneath the surface. Owing to snow conditions, I was unable to explore any open cuts which may have been made on this vein. Its existence, however, adds to the possibilities of the property. The south-easterly and north-westerly veins previously mentioned have not been prospected. From a point immediately above the portal of the new tunnel extending easterly to the boundary line of the Fern property much float is found from one of these veins. This float from its size and mineralization indicates the existence of a vein of several feet in width, well mineralized. Assays from this float run from a trace to $12.00 per ton in gold. Existence of one old open cut indicates that it has been prospected for to some extent in the earlier days, but this cut has since caved in. The overburden is heavy, but a program of surface prospecting carried on during the summer months will allow these veins to be explored on the surface at small expense to the operators and the results, judging from the float, are likely to prove the existence of a series of veins which may add large possibilities to the property.

DEVELOPMENT:

The efforts of the Gold Fern Syndicate have been concentrated in opening up the veins on this property at an increased depth. If weather conditions had been more

DEVELOPMENT - continued:

favorable at the time when operations were started, a program of surface prospecting would have been carried out; but as a foot of snow was on the ground, the surface work was postponed until the summer and a new tunnel started. This tunnel was located so that all southwest-northeast veins can be developed from it. The primary object is to pick up the continuation of the Fern vein and drift on it, first to open up new ore bodies and second to get under the ore shoot already developed on the upper levels. This tunnel is 800 feet vertically below the No.4 level and to reach the projected Fern vein it will have to be driven between 300 and 400 feet beyond its present face. From the point where this tunnel will intersect the Fern vein, a drift southerly on the vein will extend 1700 feet before the big dyke is reached. This will be virgin ground for 1200 feet, in which there is a reasonable expectation of opening up new ore shoots. If no new shoots are encountered, but the old one should maintain its present width and length, this new tunnel would open up approximately 40,000 tons of ore. At the point where the Fern vein will be first intersected, the vertical depth below the surface will be about four hundred feet below the outcrop, so that any new shoots opened up by this development will represent a large tonnage immediately available for mining.

ORE RESERVES:

The known ore reserves consists of the ore remaining between the No.4 level and the surface. As the timbering in these old tunnels has to be partially renewed before they can be accurately surveyed and sampled, the tonnage left here can be but roughly estimated as to quantity and value. The stopes mined are from one foot to 12 feet in width, with an average width of not less than three feet. The total tonnage of the ore developed above the No.4 level, using an average mining width of three feet, is about 20,000 tons. It is estimated from a study of the production of the mine that not more than 15,000 tons have been mined, which would leave available above No.4 level 5,000 tons of ore. The winze on No.4 level has authentically been reported to me as being fifty feet deep, all in good ore. From this winze one ore shipment is reported to have been made to the smelter. Assuming the ore continues to this depth, an additional 2800 tons of probable ore is available. The value of this ore, based on past production records, with an allowance of 25 per cent. for mill losses and figuring on the increased price of gold, should be not less than $20.00 per ton. These figures give an approximate value of positive and probable ore in the Fern mine of $156,000.00.

While the tonnage given is only estimated, I believe it is conservative. A considerable area above the No.3 level, particularly in the vicinity of the dyke, has not been stoped and a large area between No.3 and No.4 levels still

ORE RESERVES: continued:

remains in place. The values per ton as estimated above, based on past production averages, are confirmed by miscellaneous samples recently taken:

| SAMPLE | LOCATION | WIDTH | AU. | AG. | VALUE |
|---|---|---|---|---|---|
| No.1 | Next fault | 4' | 1.04 | 1.4 | |
| " 2 | Top winze, No.3 level | Grab | .88 | 1.0 | |
| " 3 | Vein No.3 | 3' | .29 | 0.4 | |
| " 4 | Fl. No.4 level, 20' from winze | 3' | .01 | Tr | |
| " 5 | Fl. No.4, 20' back from No.5 | 3' | .16 | 2.80 | |
| " 6 | Stope above 4 | Grab | 3.76 | 3.20 | |
| " 7 | 30' south of raise, 4th. level | 1.5' | 2.2 | 1.2 | |
| " 8 | 15' south of raise, 4th. level | 1.5' | 0.92 | .7 | |
| " 9 | Stope under No.3 | 3' | 0.56 | 1.04 | |
| " 10 | Stope under No.3 | 3' | 1.88 | 1.22 | |
| " 11 | Stope under No.3 | 2' | 1.44 | 1.0 | |
| AVERAGES: . . . . . | | 2.66 | 0.727 | 1.1 | 25.30. |

Eliminating the grab samples, these give an average width of 2.66 feet and a value of $25.30 per ton in gold and silver. Allowing for dilution due to stoping to a width of three feet, the average of $20.00 per ton assumed in estimating is reasonable.

FUTURE WORK:

A program of surface prospecting should be started at the earliest date possible. The extension of the Fern vein should be traced by open cuts to a point vertically above where it appears most advantageous to intersect it with the new tunnel. This will also allow a fairly accurate determination of the point where this vein can be expected to be reached, and will reduce the chances of overlooking it if the intersection should occur where it is in a pinched condition. The southwest-northwest vein should be explored on the surface to definitely determine its strike and dip, to allow it being crosscut from the new tunnel level. The Old Man vein should be prospected at the surface above the level of No.3 tunnel, with a view of crosscutting it at the most promising point from that level or from No.4. The area south of the fault should be carefully prospected at the surface, with a view of definitely determining the position of the Fern vein in that area and thus allow it to be picked up on the lower levels. This program should not require over thirty days to complete.

The results of this prospecting will decide the immediate underground work to be done. If the Old Man vein is found to be as represented by other Engineers, it may be found advisable to drive a new tunnel, probably 100 feet below No.4 level, opening up both the Fern vein, the one showing in

FUTURE WORK, continued:

the crosscut at No.3 level and the Old Man vein.

A detail examination of the timber in the old workings may indicate that a raise from a lower level to No.4 is the most advantageous method of mining the ore now exposed in the old levels. Until the prospecting of the surface is completed, it seems best to reserve judgment on the final program to be adopted, but during the conduct of this prospecting program, work on the new tunnel can be continued toward the Fern main.

SUMMARY:

The Fern property has been definitely proven to contain commercially valuable gold ore. Its past record is a favorable one. There is justifiable hope of finding other ore bodies along the southerly and northerly extensions of the Fern vein, from the ore shoot now developed. The existence of three other veins, approximately similar in strike and dip, merits the expectation of finding commercial ore outside the limits of the Fern vein.

An extensive program of development is fully warranted and I have confidence that if the program is carried out under competent technical advice, it will be financially successful.

Nelson, B.C.,
February 26th., 1935.

Appx. Position OLD MAN VEIN

Outcrop Esso Vein

STOPE

No 1

STOPE

No 2 Vein

STOPED

No 2

STOPE

No 3

STOPE

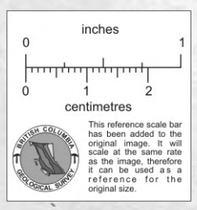
STOPE

DYKE

STOPE

DYKE

No 4




# PLAN

## OF THE

# FERN MINE

## Nelson, B.C.

Scale- 60' to 1"

Taken from existing records.

W.M. Myers ME.

# PLAN

## SHOWING PROPERTY OF THE

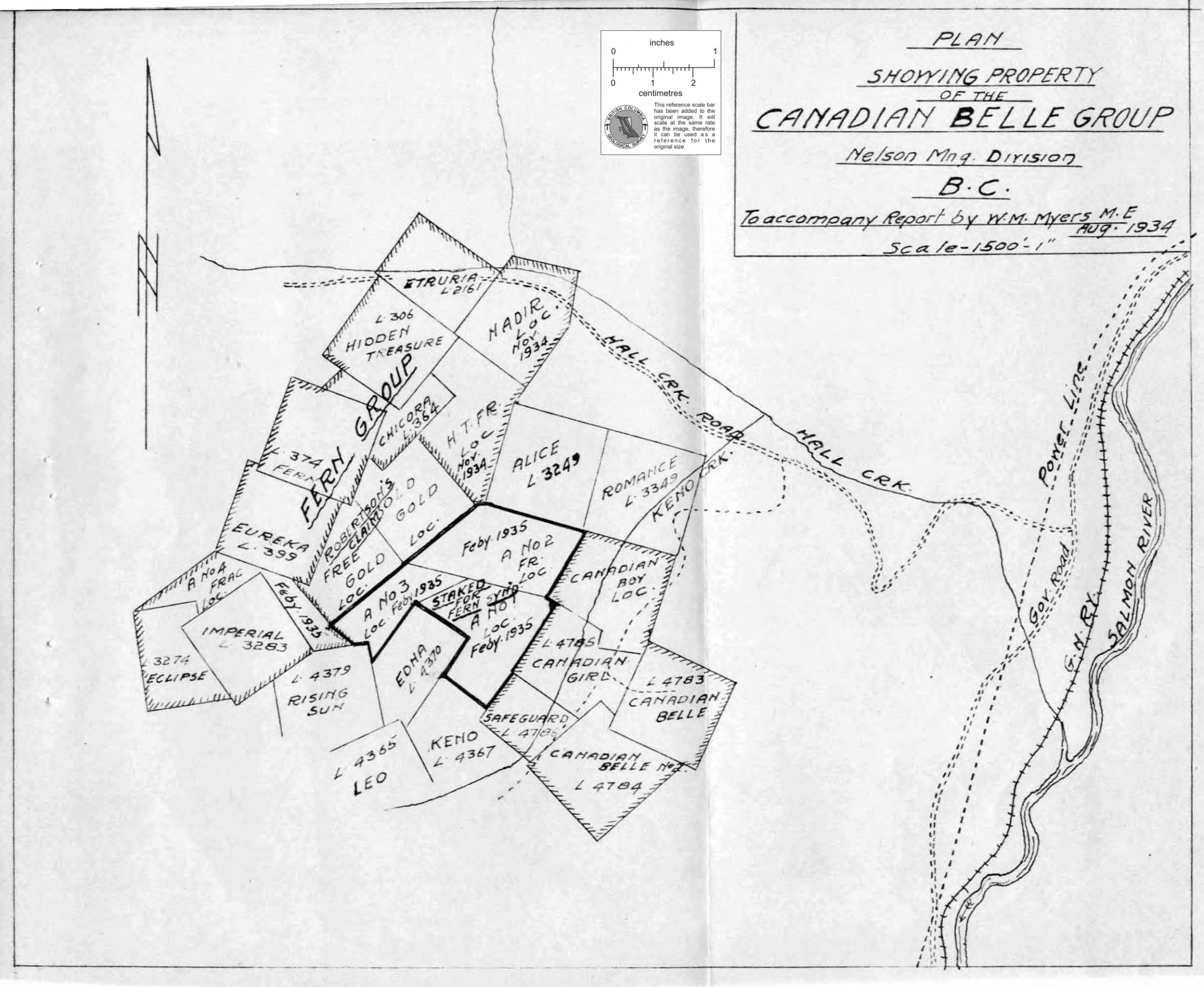
# CANADIAN BELLE GROUP

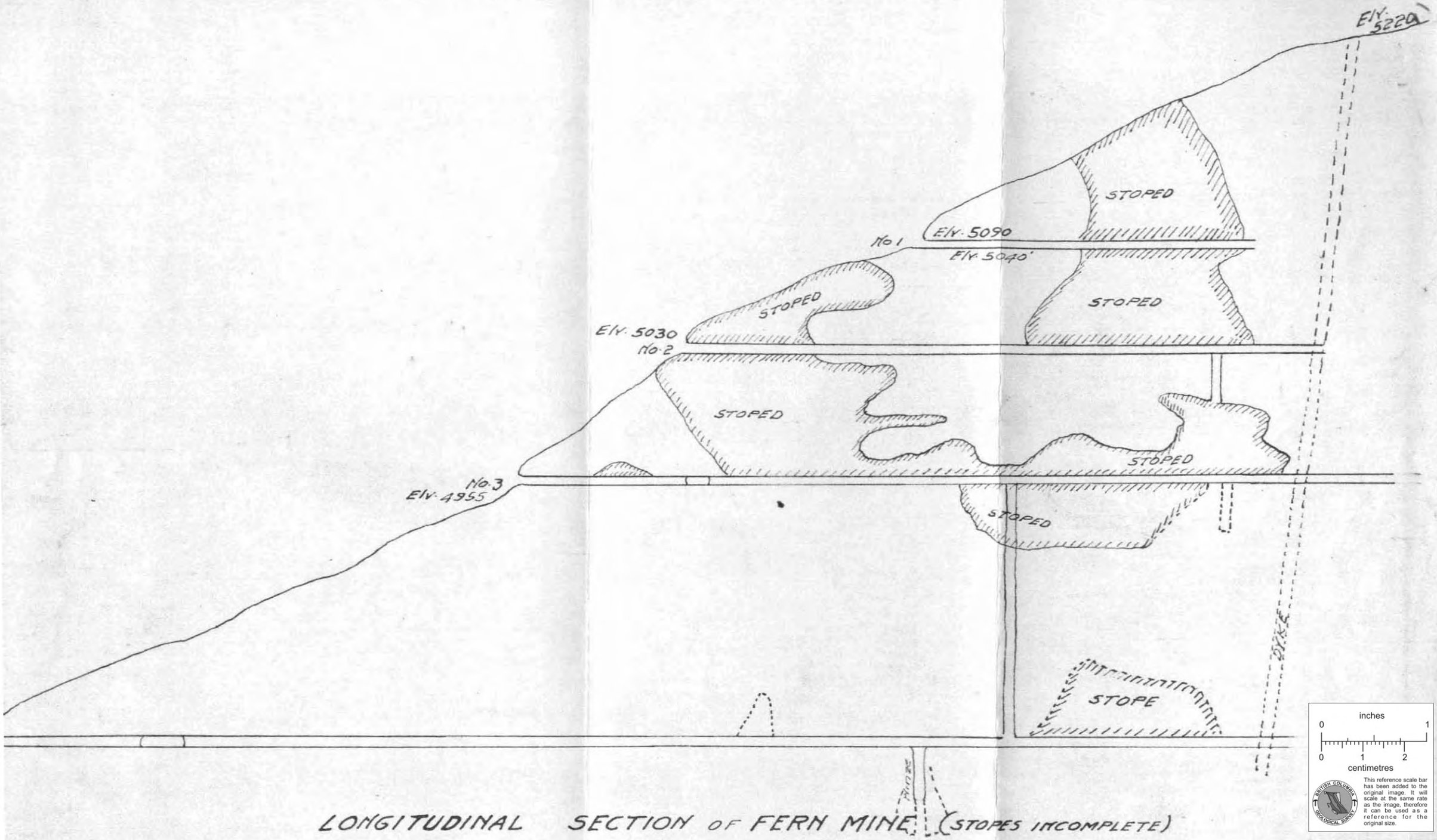
## Nelson Mng. Division

## B.C.

To accompany Report by W.M. Myers M.E. Aug. 1934

Scale - 1500' - 1"






LONGITUDINAL SECTION OF FERN MINE (STOPES INCOMPLETE)